Introduction to BIOLOGY

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SCIENCE

Science is the study in which

- **OBSERVATIONS ARE MADE,**
- **EXPERIMENTS ARE DONE**
- **AND LOGICAL CONSEQUNCE ARE DRAWN**
- **IN ORDER TO UNDERSTAND THE PRINCIPLES OF NATURE.**

What is Biology?

- ***Bio*** **– means life**
- ***logos*** **– to study / the study**

- ***BIOLOGY –*** **is the study of life / the study of living things**

Living Things










Properties of Life

Living organisms:

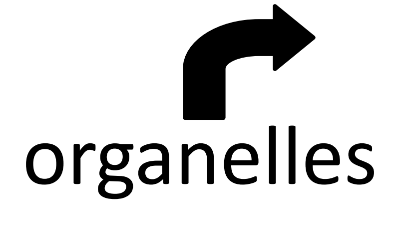
- Are composed of cells (Cellular Organization)
- Are complex and ordered (Ordered Complexity)
- Respond to their environment (Sensitivity)
- Can Grow, Develop and Reproduce
- Obtain and use energy (Energy Utilization)
- Maintain internal balance (Homeostasis)
- Allow for Evolutionary Adaptation

Levels of Organization

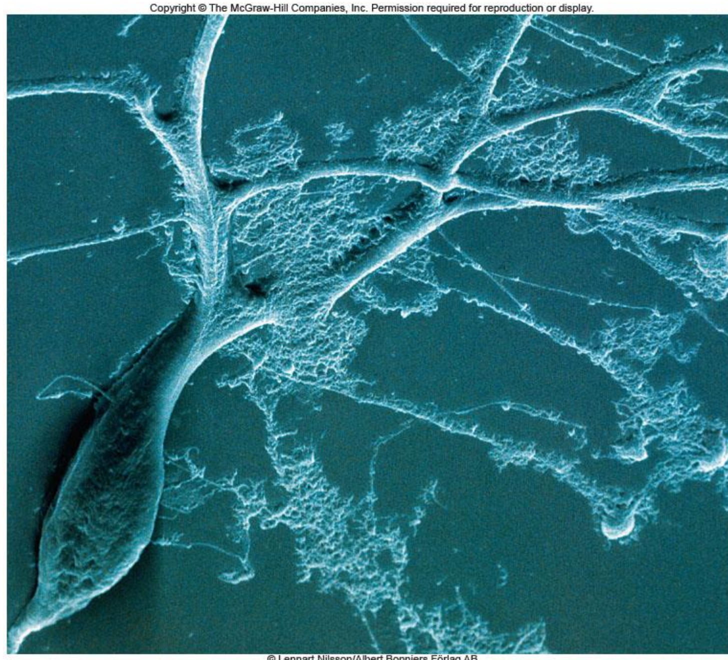
1. Cellular Level
   - Atoms molecules organelles cells
2. Organismal Level
   - Tissues organs organ systems
3. Population Level
   - Population species biological community
4. Ecosystem Level
   - Biological community + physical habitat (soil, water, atmosphere)
5. The Biosphere
   - The entire planet thought of as an ecosystem

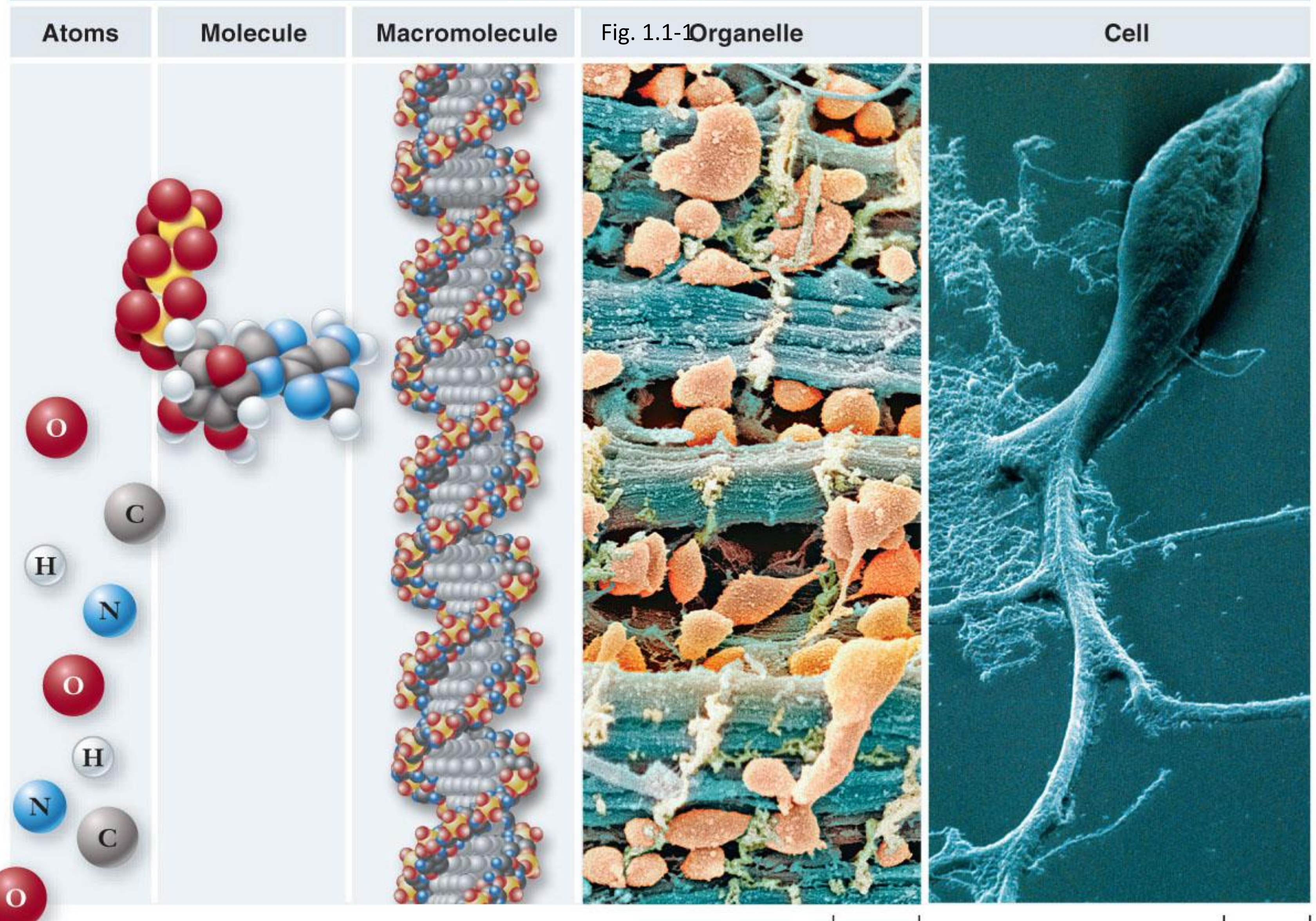
Levels of Organization

- Cellular Organization
- cells
- organelles
- molecules
- atoms



- The **cell** is the
- basic unit of life.



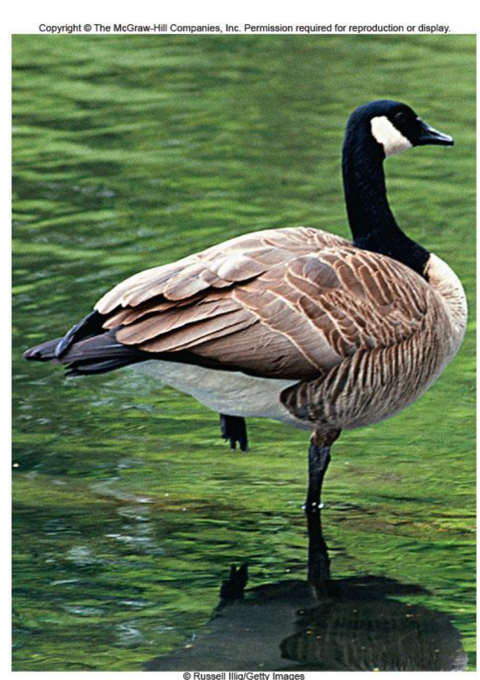


(organelle): © S. Gschmeeissner/SPL/PUBLIPHOTO; (cell): © Lennart Nilsson/Albert Bonniers Förlag AB

Levels of Organization

- Organismal Level
- organism
- organ systems
- organs
- tissues





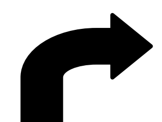
ORGANISMAL LEVEL

Tissue	Organ	Organ system	Organism

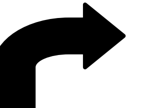
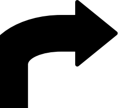
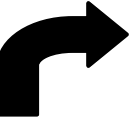
Fig. 1.1-2

100 µm

Levels of Organization

- Population Level
- 

  ecosystem

  
  
-  community
- species
- population

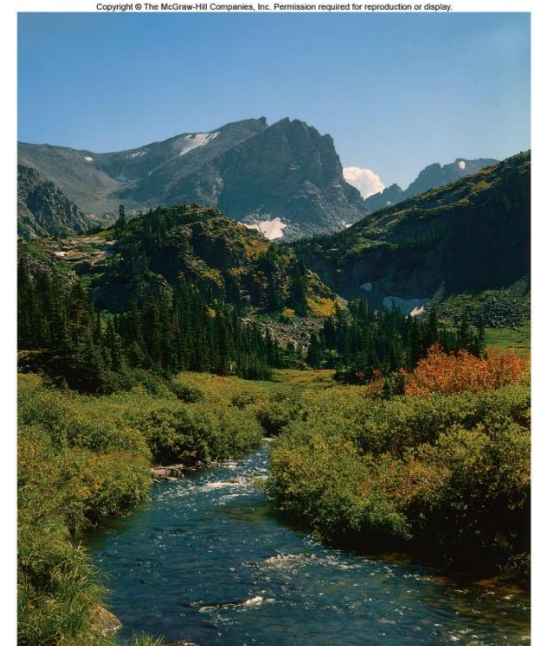


Fig. 1.1-3



(population): © Jeremy Woodhouse/Getty Images; (species (both)): © PhotoDisc/Volume 44/Getty Images; (community): © Steve Harper/Grant Heilman Photography; (ecosystem): © Robert & Jean Pollock; (biosphere): NASA

Levels of Organization

- Each level of organization builds on the level below it but often demonstrates new features

- **Emergent properties**: new properties present at one level that are not seen in the previous level

Divisions of Biology

3 MAJOR DIVISIONS OF BIOLOGY

- **Botany** – the study of PLANTS
- **Zoology** – the study of ANIMALS
- **Microbiology-** – the study of MICROORGANISMS







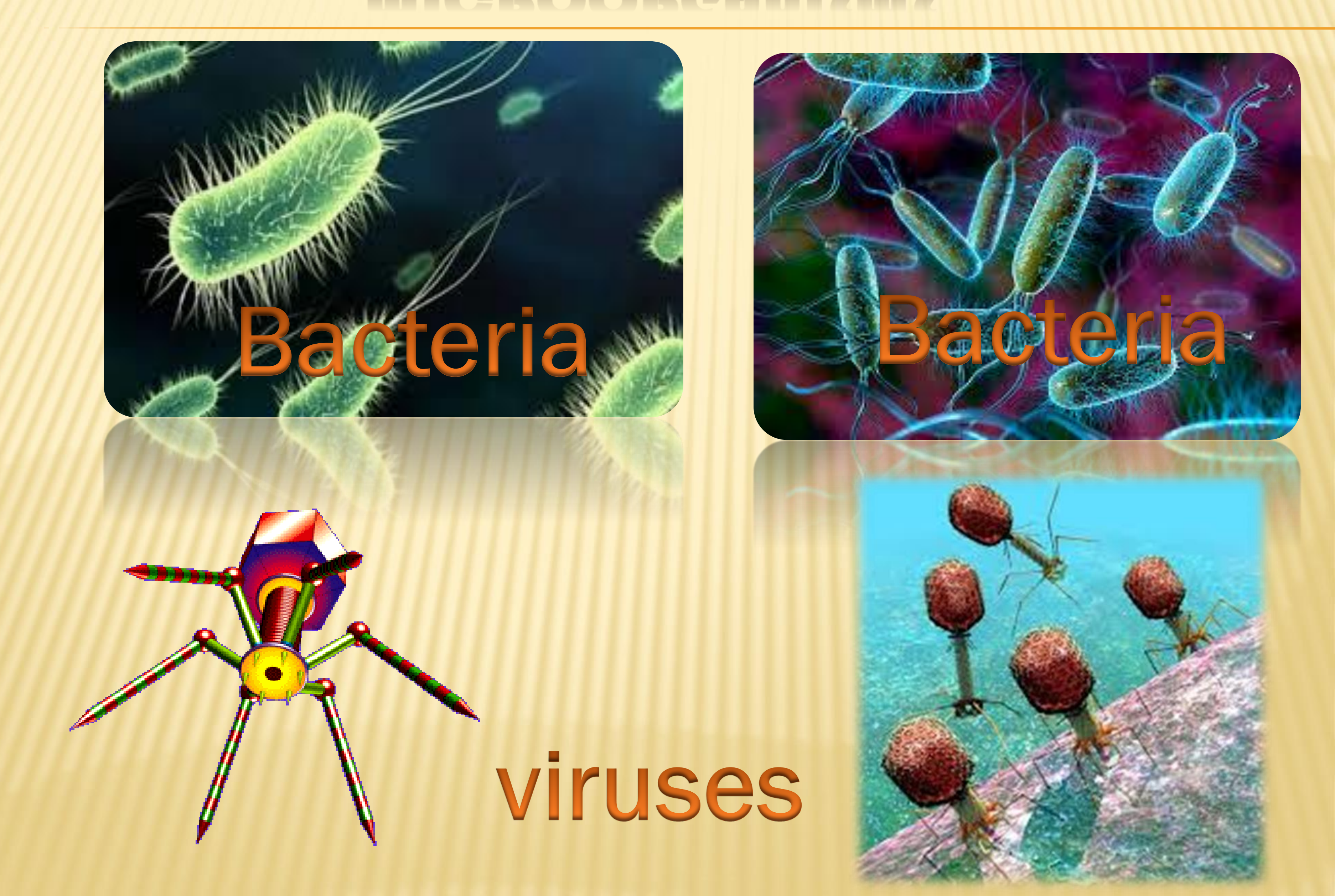
BOTANY






ZOOLOGY

MICROORGANISMS



Some Branches of Biology

Morphology

- **The study of form and structure of living organisms.**




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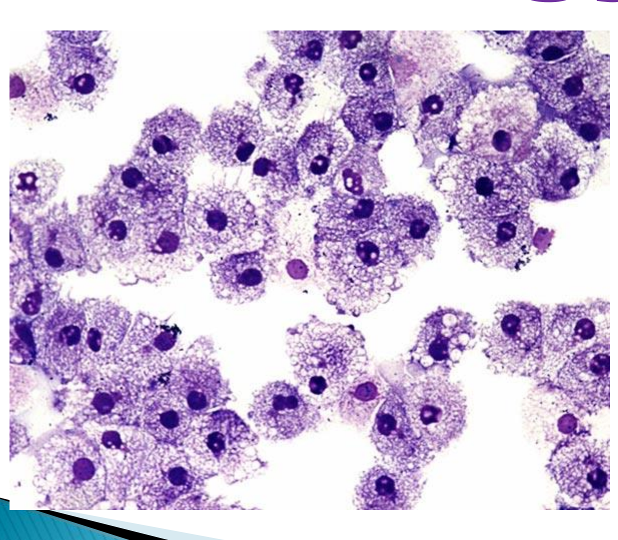

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ANATOMY

- Anatomy is the study of the internal structures (kidney, hert, liver etc.)

HISTOLOGY

- The microscopic study of tissues is called **histology**.





Cell biology

- CELLS

- CELLS ORGANELLES

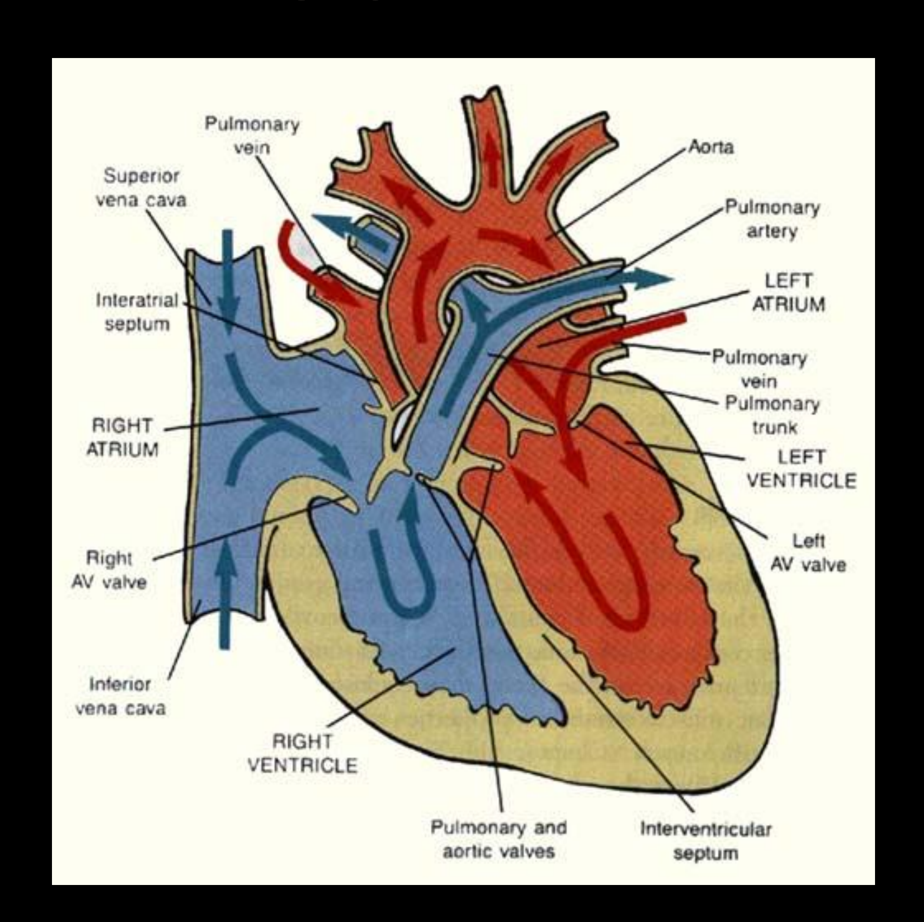
CELLS



Physiology

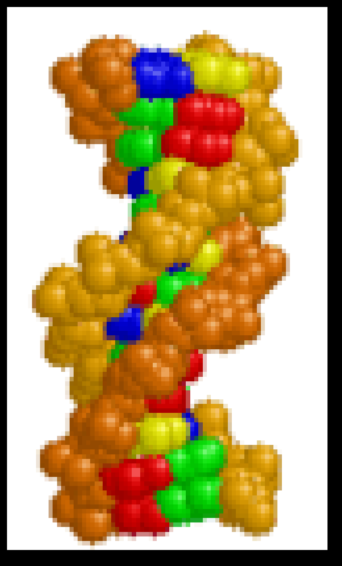
- the study of

  of different parts of living organisms.



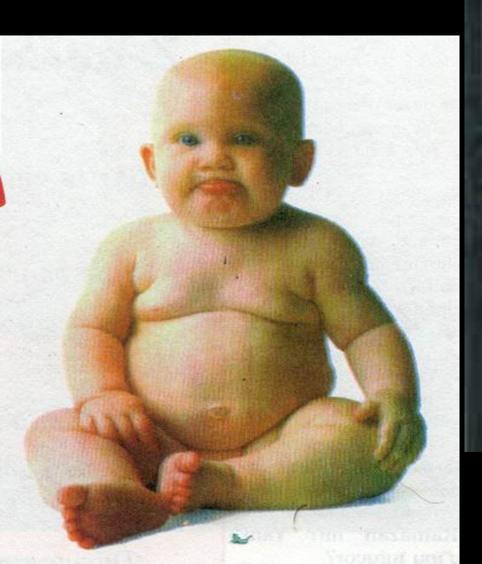
- **Genetics –**
- the study of genes and their role in **inheritance**.
- **Inheritance:**
- **The transmission of character from one generation to the other.**





Embryology

- The study of the development of an **embryo** to new **individual**.





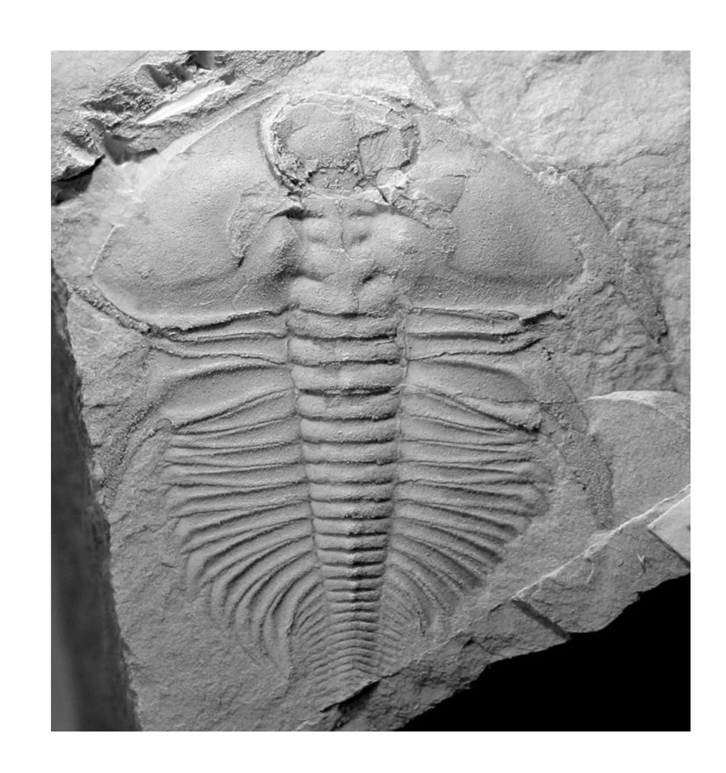
TAXONOMY

- Study of the naming and classification of organisms into groups and subgroups.

Paleontology

- **the study of fossils, which are the remains of extinct organisms**





SOCIO BIOLOGY

-

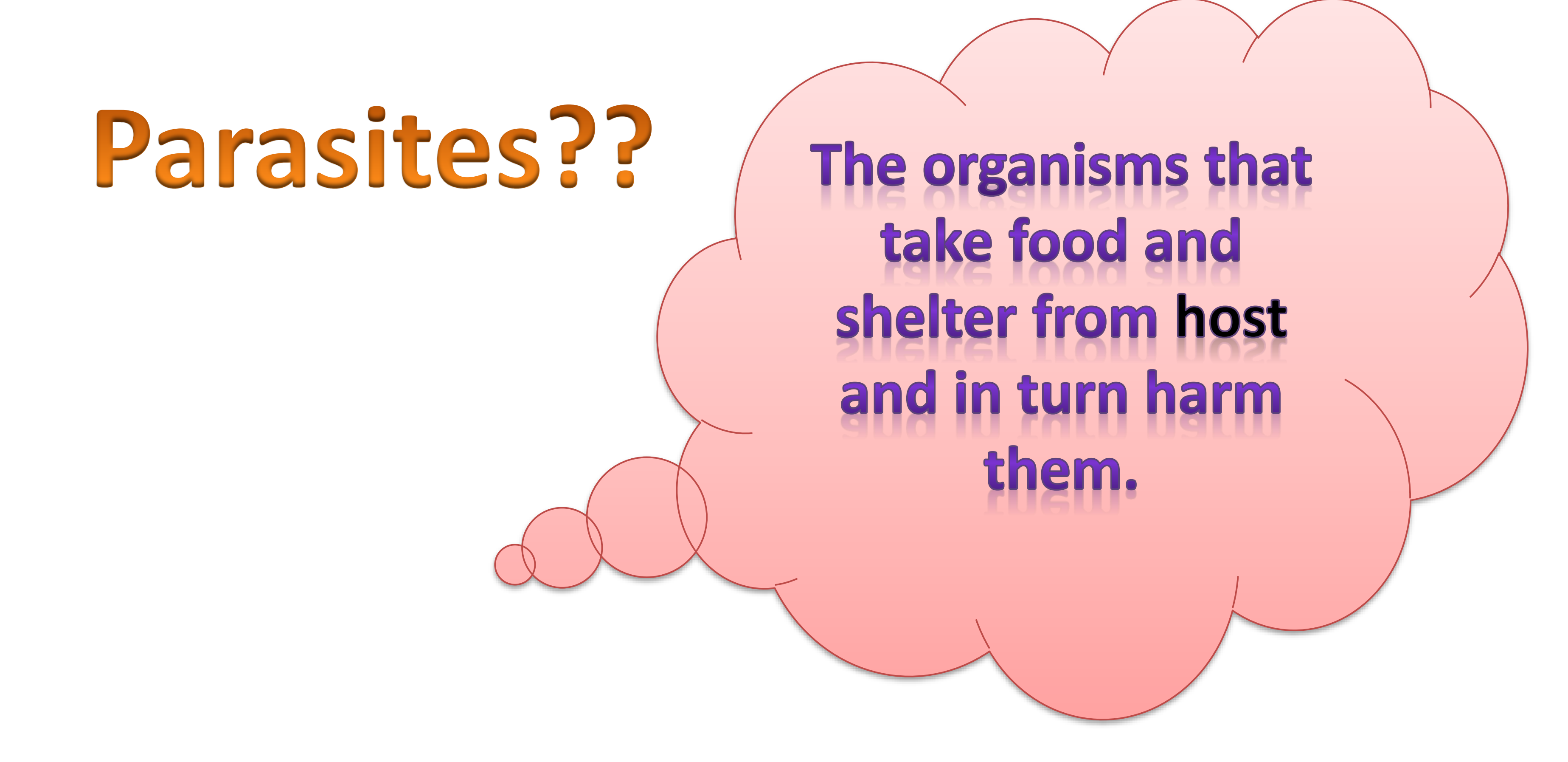




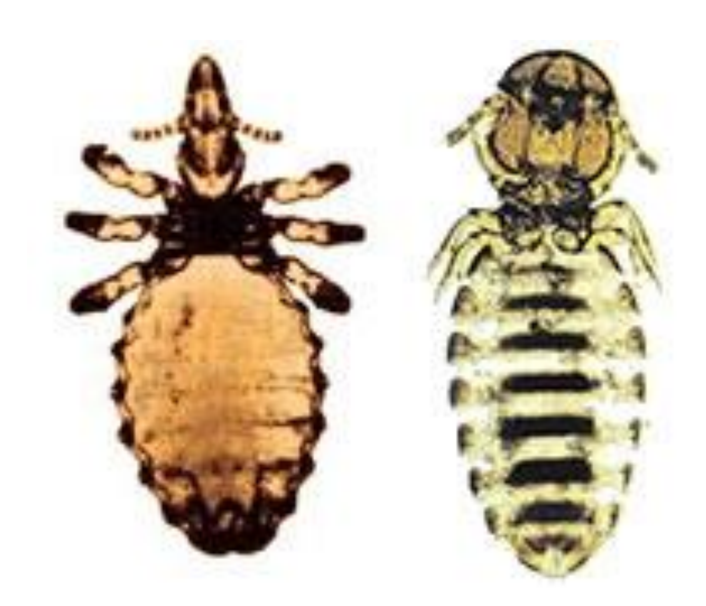


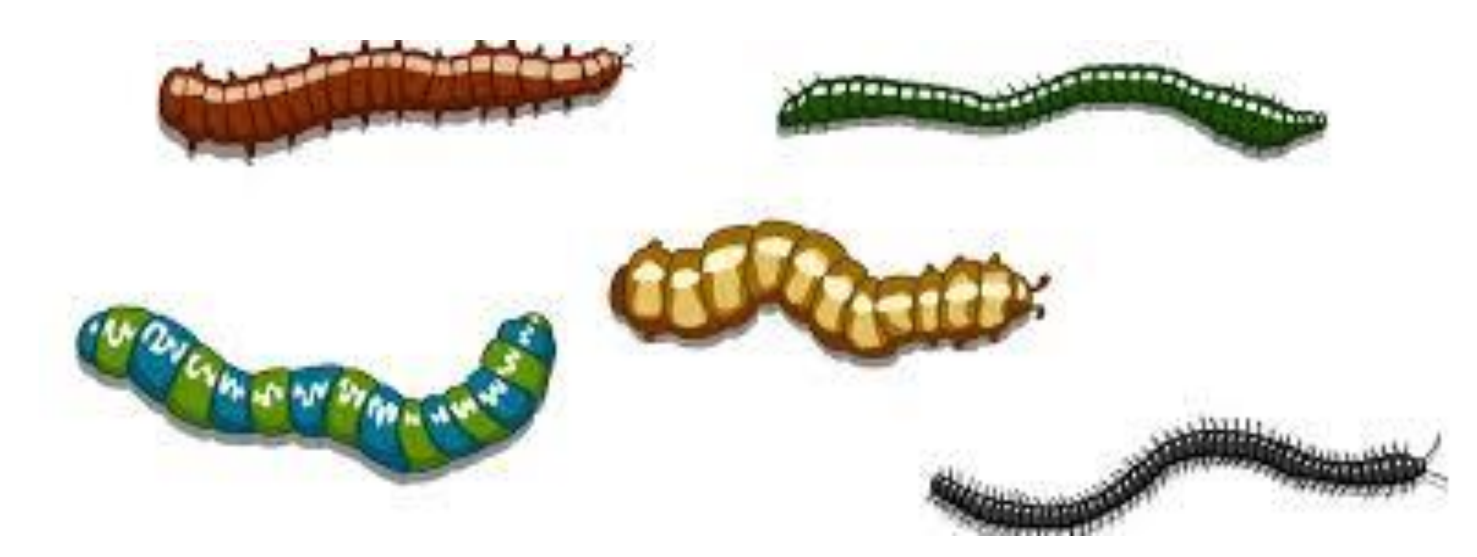
Parasitology

- – the study of the parasites.




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BIOTECHNOLOGY

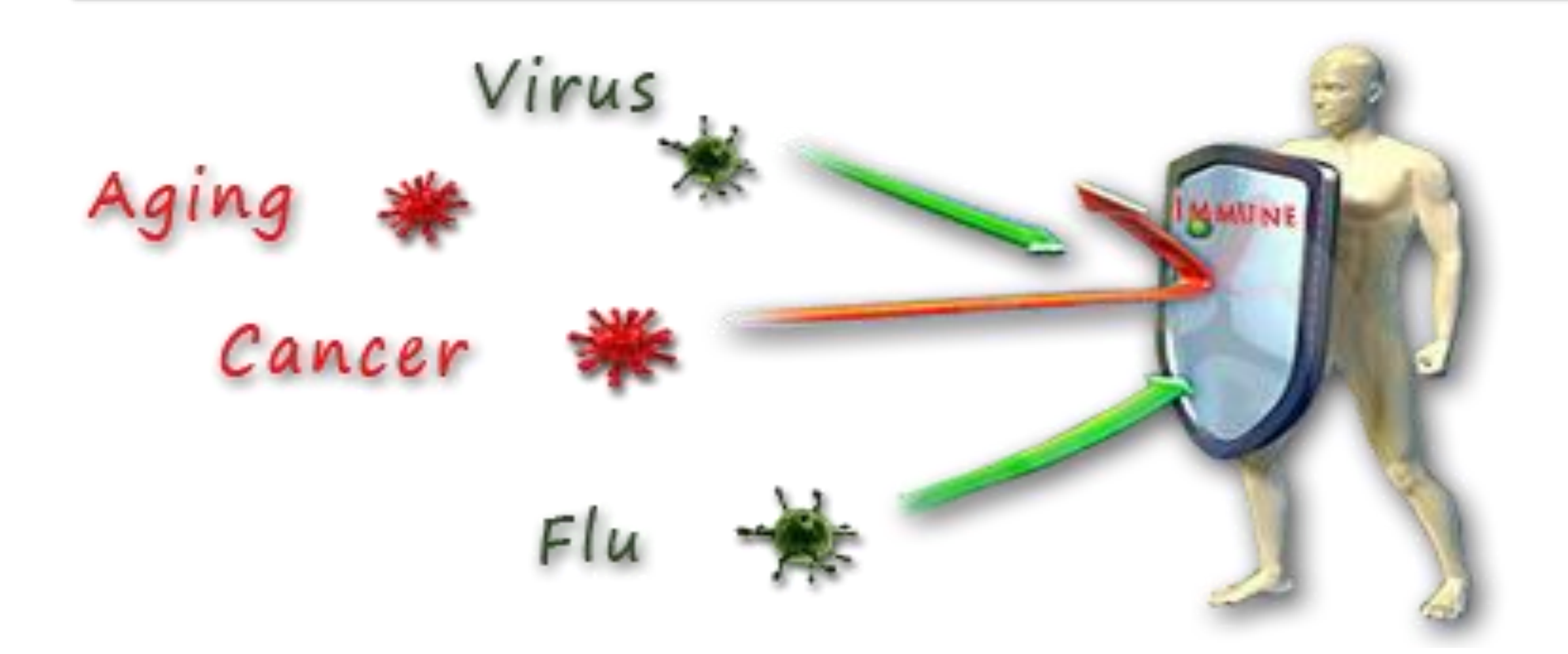
- The practical application of living organisms to manufacture substances for the welfare of mankind.





IMMUNOLOGY

- The study of the immune system of the animals which defend the body against invading microbes.



ENTOMOLOGY

- Study of insects.







PHARMACOLOGY

Study of drugs and their effects on the system of human body.

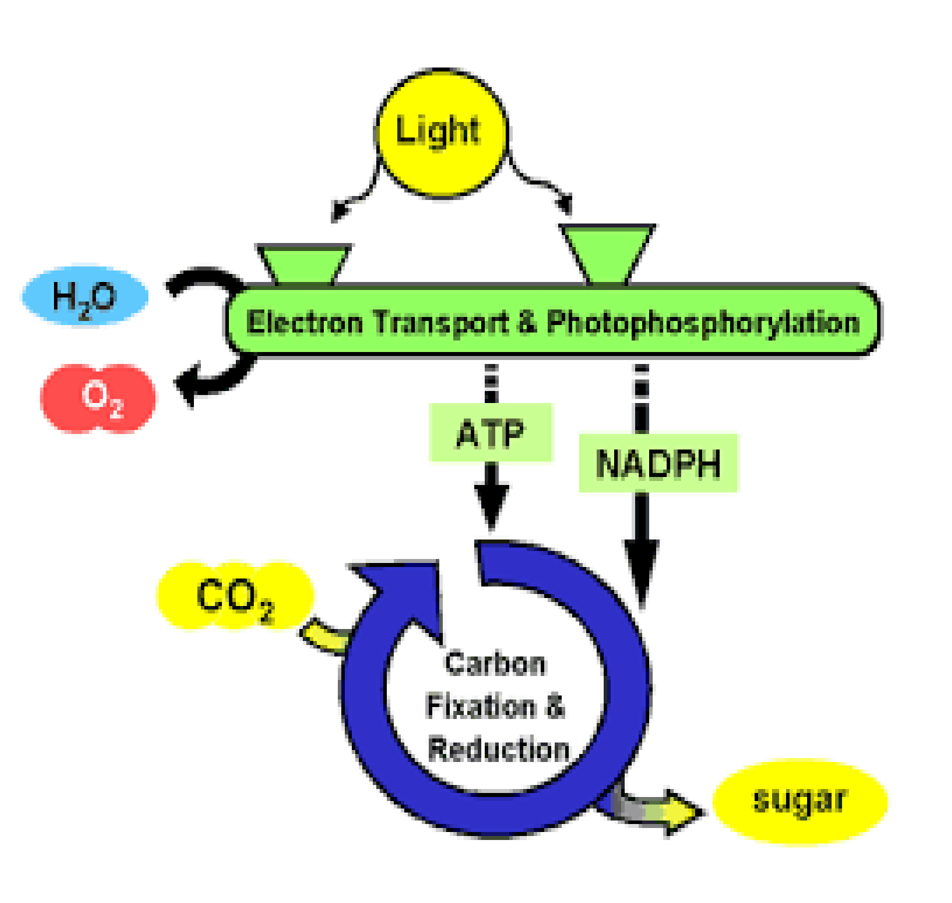


BIOPHYSICS

It deals with the study of
Principles of physics
which are applicable to
biological phenomenon.

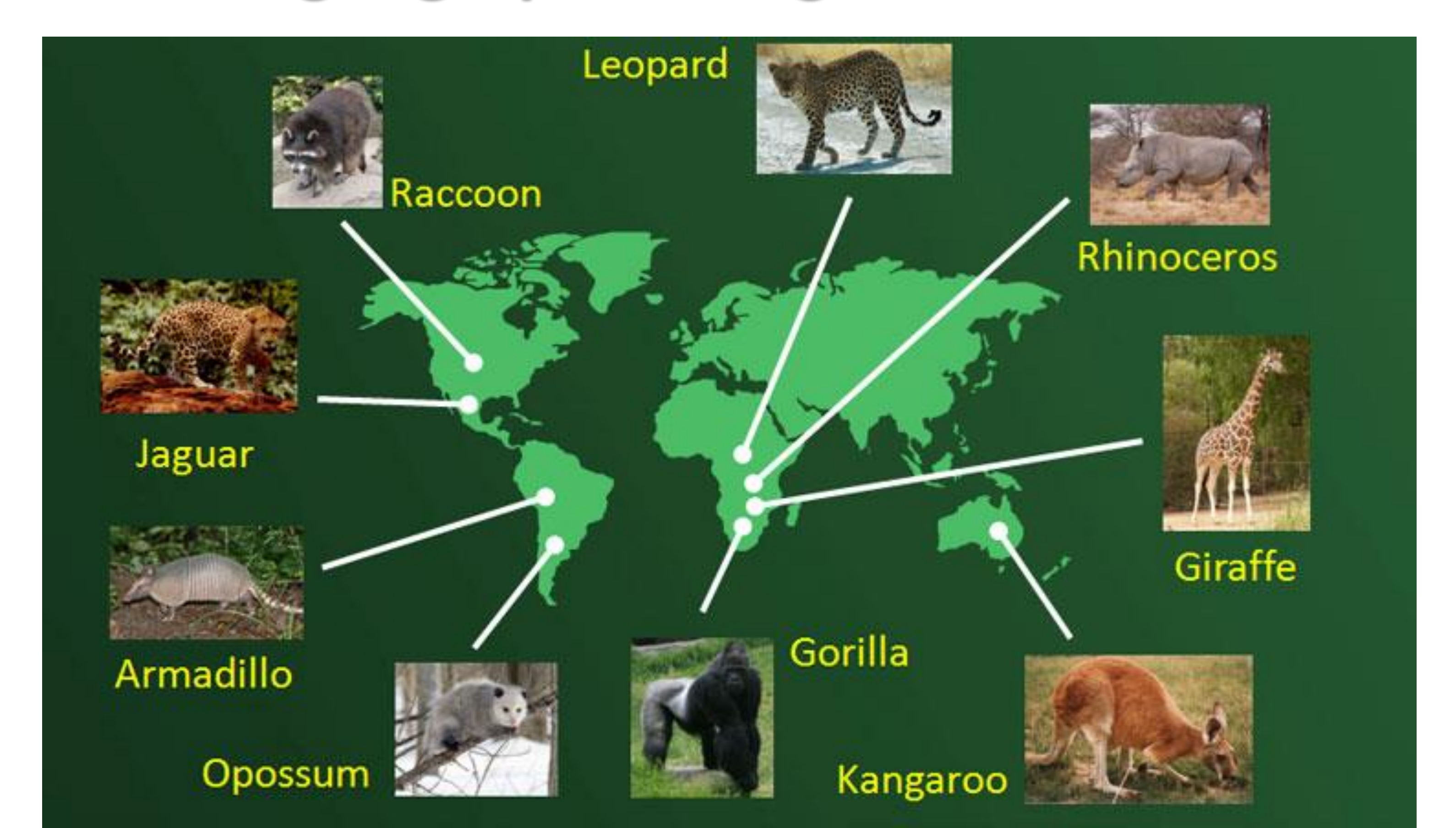
BIOCHEMISTRY

- **It deals with the study of the chemistry of different compounds and processes occuring in living organisms.**



BIOGEOGRAPHY

- **It deals with the study of the occurrence and distribution of different living organisms in different geographical regions of the world.**



BIOECONOMICS

POINT OF VIEW.





THANK YOU